

ARNAV TIWARI

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EDUCATION

Indian Institute of Technology Kharagpur

July 2017 - Present

Fourth Year Undergraduate Student

Department of Mechanical Engineering *[ongoing]*

Minor in Computer Science and Engineering *[ongoing]*

TECHNICAL STRENGTHS

Languages	C, C++, Python, JavaScript, Bash
Web & Servers	HTML, CSS, Node.js, Express.js, React, Webpack, Ruby On Rails, Flask, WebRTC, WebSockets
Databases	MySQL, SQLite, MongoDB, Redis
Platforms	Git, Linux, Docker, Heroku
Libraries & Frameworks	jQuery, CUDA, OpenMP, OpenCV, Numpy, STL
Security	x86 Assembly, Web Application Penetration Testing, Linux System Administration, Reverse Engineering, Network Security
Others	GPU Parallelization, Deep Learning, Image Processing Computer Networks, Operating Systems

EXPERIENCE

Google Summer of Code

May 2020 - September 2020

Student Developer at Matrix

<https://github.com/arnav-t/riot-embedded>

- Developed a highly customizable and lightweight React based embedded Matrix messaging client from scratch.
- The project was used by CommCon UK 2020 conference and KDE Academy 2020 conference.
- Handled the client interactions to adapt the project, incorporate feature requests and ease the integration and deployment into large-scale production environments for various clients.

HackerRank

May 2019 - July 2019

SDE Intern

- Worked on optimizing the MySQL production database and the Ruby on Rails backend of HRW.
- Developed the Node.js framework for Role-Based Assessment tests and wrote unit tests for it.
- Detected and fixed various security vulnerabilities on hackerrank.com and associated websites.

Kharagpur Winter of Code

December 2018 - January 2019

Project Mentor

- Mentored 3 projects in C++, Python, Javascript, HTML and CSS with over 23 student participants from all over the world.

PROJECTS

GitHub Projects

2017 - Present

C, C++, Python, JavaScript, HTML, CSS

- **JS Boids:** Simulation of boids in JavaScript.
<https://github.com/arnav-t/js-boids>
- **deephoven:** Classical piano music generation using LSTM networks.
<https://github.com/arnav-t/deephoven>
- **Fractals JS:** Interactive fractal explorer made in JavaScript.
<https://github.com/arnav-t/Fractals-JS>
- **Pursuit Wallpapers:** Web app to generate wallpapers of pursuit curves.
<https://github.com/arnav-t/pursuit-wallpapers>
- **CASA:** API for cab sharing posts.
<https://github.com/arnav-t/cab-api>
- **Shooting-Game:** A top down shooter game made using C++ and OpenCV.
<https://github.com/arnav-t/Shooting-Game>
- **What Slot:** A web-app made in Python (Flask) to help the students of IIT Kharagpur in selecting the right additional and breadth courses according to their time table.
<https://github.com/arnav-t/what-slot>
- **xscreeencast:** A lightweight screencasting tool made in C (Xlib) for the X Window System.
<https://github.com/arnav-t/xscreeencast>
- **rest-captcha:** A REST API made in Python (Flask) for solving captchas.
<https://github.com/arnav-t/rest-captcha>

Video Conferencing Framework

July 2020

JavaScript, WebRTC, Kurento Media Server/GStreamer

- Working on a WebRTC based video conferencing solution which will use a mix of peer-to-peer and MCU configurations to provide a highly scalable way of organizing video conferences.

ADAS Pedestrian Detection

March 2019

C++, CUDA, Python

- GPU accelerated pedestrian detector made in CUDA and C++. Highly parallelized implementations of HOG (Histogram of Oriented Gradients) detector and SVM classifiers trained on the INRIA dataset to detect bounding boxes of pedestrians in images.

3D Molecular Dynamics

March 2019

C, C++, OpenMP, OpenCV

- Highly parallelized 3 dimensional molecular dynamics simulation of an ideal gas with three degrees of freedom including a graphics visualizer.

Elastic Cord Physics

April 2016

C++, SDL2

- A program to simulate and visualize the stresses in an elastic cord during free motion.

Soft Body Physics

March 2015

C++, SDL2

- A soft body engine made using C++ and SDL2 library which uses Hooke's Law and damping to approximately simulate a two dimensional deformable soft body.

RELEVANT COURSES

Classroom Courses

CS11001: Programming and Data Structures
MA20104: Probability and Statistics
CS61064: High-Performance Parallel Programming
CS31702: Computer Architecture and Operating Systems
CS60050: Machine Learning

Other Courses

Deep Learning Specialization - Coursera
Introduction to Computer Vision - Udacity
Networking for Web Developers - Udacity

EXTRA-CURRICULAR AND CURRICULAR ACTIVITIES

Attended Image Processing workshop by IEEE in December 2017.

Participated in Fortress, Kshitij 2018 a competition for Computer Vision based bots.

Ex-member of Robotix Society, IIT Kharagpur

Ex-member of Autonomous Ground Vehicle research group, IIT Kharagpur

Executive Head at Kharagpur Open Source Society (KOSS)

Taught in Hacking Workshop at Kshitij 2019, IIT Kharagpur